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### The Cities of Japan: Notes on Distribution and Inherited Forms\*

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The cities of Japan offer a most complex and fascinating field of geographical research. No attempt is made, in this paper, to cover all aspects of Japanese urban geography. In fact, only two phases of the study are considered. First, the salient features of the distribution are pointed out. Secondly, the more common and more important basic city patterns are described and their origins are explained.

On Figure 1 are shown all of the urban agglomerations in Japan proper, as of the census of 1930. The hollow circles indicate the legal cities or "shi," defined as settlements of 25,000 or more people which have been recognized by the Municipal Corporation Act. There were 107 cities, by this definition.<sup>1</sup> The solid and smaller circles or dots indicate the "machi" or "cho." Town is probably the best English translation of these terms although not an exact one. The area of the machi is not always confined to the site of the agglomeration but may include, in addition to the main settlement, one or more small villages and limited areas of agricultural land. In such cases, the dot on the map represents the location of the major settlement after which the machi is invariably named. All have been granted

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<sup>1</sup> The 1930 census of Japan lists 109 shi, but includes Naha, the metropolis of Ryukyu, and Shuri, which was granted shi status but has a population of only 20,118.

machi status and have organized town governments. The larger of the machi will exceed 100,000 people. A few of the smaller ones, included in the census, have only 1,000 or so people. The vast majority, however, have populations of from 3,000 to 30,000. Only machi with 2,500 or more

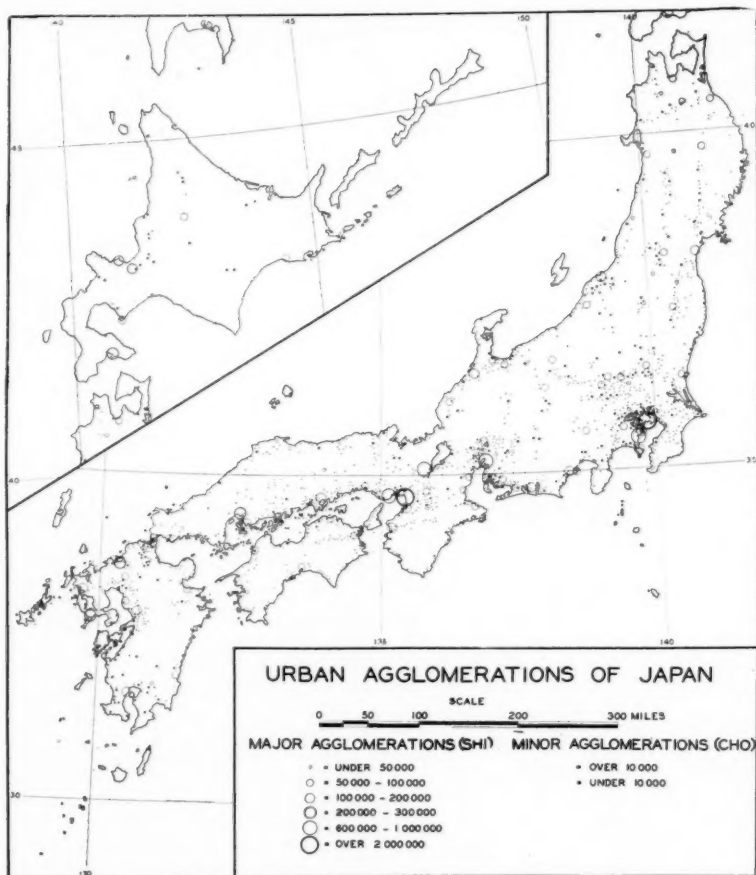


FIG. 1.—The distribution of "shi" and "cho" or "machi" in Japan. Of interest is the absence of cities between 300,000 and 600,000 population and between one and two million. Since the latest census Kyoto and Nagoya have expanded in area and now claim populations in excess of 1,000,000.

people have been considered.<sup>2</sup> In all of them some urban functions are performed. The administrative and other government buildings alone distinguish the machi landscape from that of the agricultural village. There were 1608 of these machi or secondary urban agglomerations according to the census of 1930.

Of the legal cities, *i.e.*, shi, there are included two with populations in excess of 2,000,000 (Tokyo and Osaka); four with over one-half million each (Nagoya, Kobe, Kyoto, and Yokohama); 46 with 50,000 or more population; and 34 between 28,000 and 50,000.<sup>3</sup> Of the machi four have populations of over 100,000; 19 have between 50,000 and 100,000; 390 have 10,000 or more people but less than 50,000; and 1167 have populations of from 2,500 to 10,000.

#### DISTRIBUTION OF CITIES (FIG. 2)

All cities of the first class and, in fact, nearly all of the second class, are located on alluvial plains or are in part built upon hills or terraces bordering alluvial plains. The size of the cities and the size of the plains upon which they are located are in close agreement. Tokyo is on the Kwanto Plain (the largest plain in Japan), Osaka on the Osaka Plain, Nagoya on the Nagoya Plain, etc. The larger of the alluvial plains are sea border plains and all the great cities except Kyoto are so located. The interior waste-filled grabens, or basin plains, are relatively small and on them are located many secondary cities.

The pattern of city distribution, in addition to indicating the plains areas, broadly outlines the major surface features of Japan. In northern Honshu, for example, the two nearly parallel chains of grabens which lie on either side of the Central Mountain mass are clearly delineated on Figure 1. Similarly, the great valleys marking the major dislocation line through the Kii Peninsula and central Shikoku are obvious.

Most of the cities of Japan and all of the larger ones occur in a narrow belt on or near the shores of southeastern Japan between Tokyo and Nagasaki, a latitudinal range of only 3°. Within this limited zone, five groupings may be recognized: (1) The Kwanto Plain, (2) The Tokai

<sup>2</sup> It is true that the population of the larger "mura" exceeds that of the smaller machi and shi, but mura, although usually translated as village, is in fact an areal term. The mura is almost invariably made up of several "azas" or small rural agglomerations and their fields.

<sup>3</sup> Since the census of 1930, Tokyo has annexed suburban areas (Oct. 1, 1932) and has included a total population of 5,311,000. Kyoto and Nagoya also have expanded in area and each has passed the million mark in population.

District, (3) The Kinai District, (4) The Inland Sea and (5) North-western Kyushu (Fig. 2).

The Kwantō Plain is by far the largest and most productive plain in Japan. It is also the most centrally located and upon it is the nation's capitol and metropolis, Tokyo, and its greatest port, Yokohama. Its extensive areas of alluvium form vast paddy fields and its great tongues of diluvial (pleistocene?) terrace are planted in mulberry and truck. Here converge all of the main railroads and highways of Japan. The larger rivers of the plain have very gentle gradients and unlike the rivers of most other parts of Japan are intensively used for navigation. A greater variety of manufacturing industries is represented here than in any other area in Japan. Twelve shi and more than 100 machi are located within this plain or on its borders.

The Tokai District comprises that narrow and nearly continuous belt of lowland along the Pacific shore of central Honshu, extending between the Kwantō and Nagoya plains. This lowland is made up of wide stretches of diluvial terraces and numerous rather steep and somewhat gravelly delta plains. The latter are easily irrigated and constitute excellent paddy lands and the former are largely cleared and planted in such specialized money crops as tea and oranges. The southern exposure and the protection from the winter monsoon afforded by the high mountains behind insure warm and sunshiny winters and allow the planting of winter crops. There is also an abundant and well distributed rainfall. Following this lowland is the main trunk-line railroad of Japan, built nearly but not exactly upon the trajectory of the ancient Tokaido or great East Sea Road, the Japanese "Appian Way" of feudal days. This district more than any other was favored by the Tokugawa Shoguns and the land was held either by relatives or close friends of the Shoguns' family. It was less heavily taxed and its development less hampered than any other part of Japan. There were many prosperous towns and small cities in this area in feudal days. Many had already developed some small-scale manufacturing. The coming of modern industry and trade brought rapid changes to this favored area, which is readily accessible to both Japanese and world markets. Today, the railroad carries the traveller through prosperous and growing industrial cities in a rapid succession.

The Kinai District is an area of complex faulting in which subsequent uplift and depression have about equally partitioned the surface into grabens and horsts. The waste covered surfaces of the down-faulted blocks account for the large and fertile plains of Osaka, Kyoto, Biwa and Nara and several smaller though equally fertile plains such as that of Iga. Winters are warm and sunny. Precipitation is as low as in any part of Japan but the

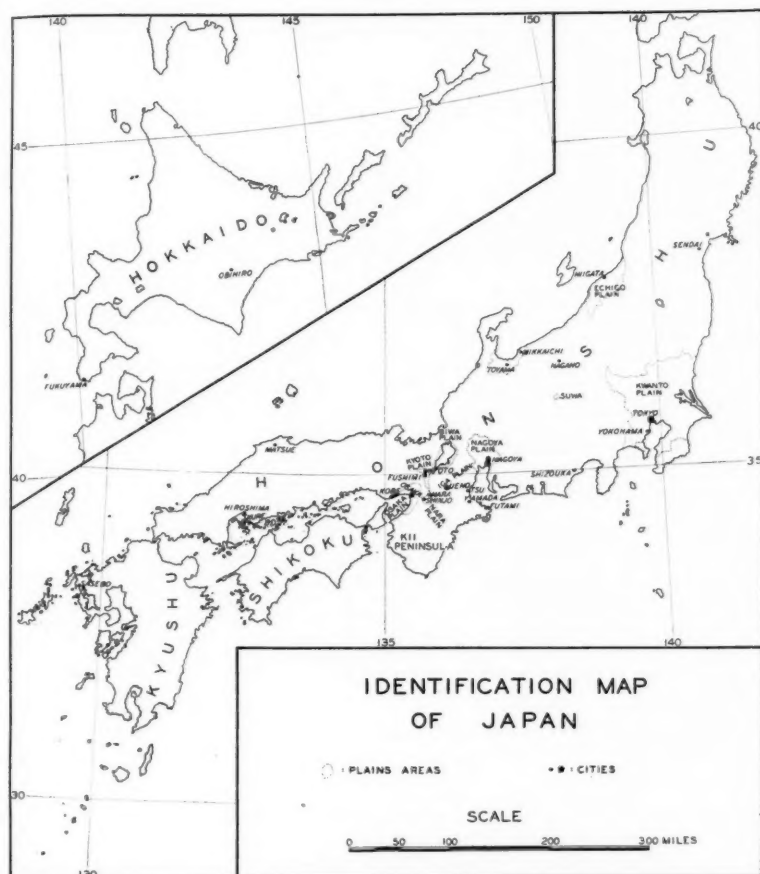


FIG. 2.—Location of places mentioned in the text.

same streams which have covered the basin floors with alluvium provide water for irrigation. In this region, man has lived in ever increasing numbers for many centuries and the modifications which he has wrought in the landscape constitute an asset of the greatest importance. The agricultural occupation has reached the climax stage. Since the Restoration many industries have been attracted to these densely populated plains. The castle, temple, and market towns of ancient days have developed into larger manufacturing and commercial centers, and today each plain supports one large city and numerous smaller ones.

The Inland Sea Region is also an area of ancient and complete settlement. To the resources of the land are added those of the Inland Sea. Here are Japan's greatest "tai" or sea-bream fisheries and here is secured at least 90% of the salt produced in Japan proper. The growing of reeds for the making of "tatami" or floor mats has long been centered here. A dense population and ready accessibility has tended to attract a variety of manufacturing industries. Many large and small cities now dot the shores of the Inland Sea.

Northwestern Kyushu contains extensive and fertile alluvial plains and the coastal people of this region have most successfully developed the resources of the seas. This area has also had the longest and most intimate contact with China of any part of Japan. Today northern Kyushu contains the most highly developed coal field of the nation. Manufacturing, commerce, mining, agriculture, and the fisheries combine to support a dozen large cities and a hundred or more smaller ones.

A secondary grouping of cities may be recognized in southern Hokkaido. These are all new settlements and are showing rapid growth. This region contains important coal fields, lies adjacent to Japan's best fishing grounds, and serves the rapidly developing agricultural lands of the north island.

Another positive feature of the occurrence of Japanese cities is the almost continuous shore fringe, particularly of smaller agglomerations, which surrounds Honshu, Kyushu, and Shikoku. If villages ("mura" and "aza") were also charted this pattern would be even more obvious and would also include Hokkaido and some of the smaller islands. This distribution, of course, expresses the important place of the sea in Japan's economy.

In regard to the negative aspects of distribution, it will be noted that there are few important cities on the Sea of Japan side of Honshu. This absence is accounted for by the limited areas of level land, the long and severe winters, the immature stage of settlement, and a condition of general isolation. There are also few cities north of Tokyo, because of longer and colder winters, late and incomplete settlement and the limited area of alluvial plain in northern Honshu, and because Hokkaido is still largely a pioneer area.

#### THE LANDSCAPE OF JAPANESE CITIES

The strictly modern features of Japanese cities, including the Europeanized buildings, factories and smokestacks, wide and paved streets, and noisy, motorized forms of transport are not greatly unlike these same features in Western lands. Yet in most Japanese cities and in large parts of all cities

of Japan, the ancient forms and structures are still recognizable, in spite of rapid alteration.

The native urban landscape has numerous distinctive characteristics which contrast sharply with those of American and European cities. Possibly the most obvious is the lack of concentric zoning within the city both of functional and of building forms. This in part explains the flattish profile which is so noticeable in Japanese cities. Another feature is the strong similarity between village and metropolitan landscapes. This applies to width and surfacing of streets, types of buildings, and general arrangement of all forms.

Until recently the city streets of Japan were, with few exceptions, narrow and winding. Awnings protruded over them from either side. They were cluttered with all sorts of materials and implements which the shopkeepers and householders could not conveniently store elsewhere. In some areas semi-public toilets were maintained at the sides or even in the middle of the streets.

To the Western observer, Japanese houses are surprisingly alike in general form and materials of construction, in spite of great variation in detail.<sup>4</sup> It is not a Japanese characteristic to flaunt prosperity. The finest residences appear as the meanest from the street. Beautiful gardens and finely executed buildings are hidden behind unpainted board fences and can only be reached through a low rickety door and a narrow passage between the closely crowded buildings of the street front. Other factors contributing to the apparent sameness of Japanese houses are, (1) the similarity of construction materials, (2) a more crystallized type of architecture than is found at least in the United States, (3) the ancient law that no private residence can reach the vertical dimensions of the temples, and (4) the fact that the ground plan of Japanese houses must conform to multiples of the standard sized "tatami" or floor mat.

The Japanese inn alone of commercial or private establishments presents an attractive entrance and the inn buildings usually are of two, three or four stories and so are readily recognizable by their greater height. The pleasure quarters occupy distinct districts and present a more imposing picture than do the ordinary buildings.

There are few old buildings in Japan. Fire is often called "The Flower of Edo." It is a constant menace and most city districts experience it at

<sup>4</sup> There is probably little more justification for this claim than there is for the Oriental observer to state that all American houses are the same. For some local differences in Japanese houses see Hall, R. B.: "Some Rural Settlement Forms in Japan," *Geog. Rev.*, 21, 1931, and *A Collection of Illustrations of Japanese Houses*, Ryokusokai Committee, Tokyo, 1931.



least once in a generation. The predominance of wood and paper in construction, the careless and universal use of braziers, open fire-boxes, and bath stoves, the high winds especially of the typhoon season, and in the past, the lack of a central water system insured fire as a regular visitor. The fire tower is one of the most common features of the urban landscape.

In the larger agglomerations of feudal days there was usually a castle and all the larger cities boasted of relatively spacious temple and shrine grounds. Practically all towns and cities, too, were on one or more of the main highways. The streets marking the passage of these roads through the town were lined with inns, shops, and other establishments catering to the traveller.

Japanese cities have distinctive and characteristic odors and sounds. No odor can be confused with that of the "daikon" or pickled radish which is so universally prepared and eaten. The night soil carts and the dank waters of the open sewers blend their unpleasant odors with the more pleasing ones of "miso" and the "sake."<sup>5</sup> The clatter of "geta"<sup>5</sup> is the sound of Japan. The shrill cries of the fish, cake, and bean curd vendors, the singsong prayers of itinerant priests, the merry laughter of countless small children playing in the streets, and the weird chanting of funeral processions give way toward evening to the tap-tap warning signal of the blind masseurs and the distant boom of temple bells. All of these sounds mingle to create an atmosphere distinctly Japanese.

#### SOME URBAN PATTERNS

Japanese city patterns are most varied and complex. Many are ancient in their origins while others are developing under our very eyes. The structure of Yagi, Nara Prefecture, for example, was determined by the road pattern laid down in the "Jo-ri" or "Han-den" prior to or during the seventh century, while Obihiro, Tokachi, hardly two decades ago set about to copy the plan of Washington, D. C. Each feudal lord had his own ideas on city planning and also had the power to enforce them as exemplified by the "Fumoto" or walled "go-samurai" quarters of Satsuma towns and by the detached checker-board town of Shinjo, "the dream of an enlightened despot." Each major change in the long economic and political history of Japan has left its impress upon the urban plan. Sectionalism, which for centuries dominated the cultural development of Japan, encouraged local variations.

Simplification and generalization therefore becomes necessary. Fortu-

<sup>5</sup> *Miso* is soup stock somewhat like bouillon, while *sake* is Japanese wine. The *geta* is a clogged wooden shoe.



nately, the centralization of power during the Tokugawa period (1615-1867) helped to bring about broad standardization and as the majority of present cities have developed from settlements of that time, the first step has been to analyze the more important causes of urban growth in feudal Japan.

Three primary causes have been identified, namely: (1) Administration and Defense, (2) Religion, (3) Commerce and Transport. Cities of the first cause are either castle towns, "joka-machi," or capital cities, "kyo." The second contain famous temples or shrines and are points of pilgrimage. These are called "monzen-machi." The third are either market towns, "ichiba-machi" or post towns, "shikuba-machi" on the great national highways. Since the advent of western civilization new commercial cities have grown up dependent upon world trade.<sup>6</sup>

The second step has been to find cities which because of isolation or other causes have kept their ancient character. Virtually all of Japan's great modern cities owe their origins to one or more of these functions but the coming of industry, power transportation, and world markets has so stimulated and changed them that they do not differ greatly from the cities of the Western World. It was necessary, then, to study smaller cities which have not experienced this growth and change.

#### CASTLE TOWNS (JOKA-MACHI)

Well over half of all Japan's legal cities, shi, and many of its machi were castle towns in feudal days. It is somewhat difficult to determine the exact number of urban agglomerations in present Japan whose morphology is related to their once being castle towns. A statement of the number of castle towns at any one time is hardly adequate as old sites were abandoned time and again and new ones were selected, as for example Shinjo in Yamato and Tomida in Izumo. The old towns usually declined but nevertheless many remained and kept the forms of castle days. About fifty such abandoned castle sites have been identified from the topographic maps, but this number doubtless omits some of them. Likewise, to state the number of fiefs is of limited value for some fiefs did not involve castles while in others there were more than one castle and castle town. The main cas-

<sup>6</sup> Nishida, Yoshiro: "Cities of Japan," *Sp. Pub., Nara Chirigakki*, 1927, p. 2, includes in his functional classification such old health and resort centers as Beppu.

See also Nishida, Y.: "The City," *Chirigakuzasshi*, Dec., 1927, p. 34 (In Japanese).

Takekoshi, Y.: *The Economic Aspects of the History of the Civilization of Japan*, N. Y., 1930, vol. I, pp. 243 ff., includes but part of Nishida's classes but adds the free ports. I have been unable to find any distinctive morphological expression in present Japanese cities traceable to this cause.

tle was occupied by the daimyo and the secondary ones by sons, other relatives, or allies. The old fiefs of Tamba, Echizen, and Kaga, for example, each had three active castle towns during the Anei Era (1772–1780). From old maps in the writer's possession the number of castle towns varied between 148<sup>7</sup> and 164<sup>8</sup> between 1775 and the Restoration. The "Pilgrims Map" published just before the Restoration shows 269 castle sites, active and abandoned. Some thirty of the abandoned ones now have no settlements related to them, while another twenty have only villages near-by. It is safe to say then that more than 200 of the present urban agglomerations of Japan may be considered in this group.

The ground plan of the castle town is distinct, as the street pattern and the distribution of certain functions is definitely adjusted to the castle and moats and to the defensive needs of the old castle. Even in the castle towns which have undergone the greatest changes the present landscape is most obviously related to the old.

As a representation of the *joka-machi*, Matsue in the prefecture of Shimane has been chosen (Fig. 3). This city was the metropolis of the

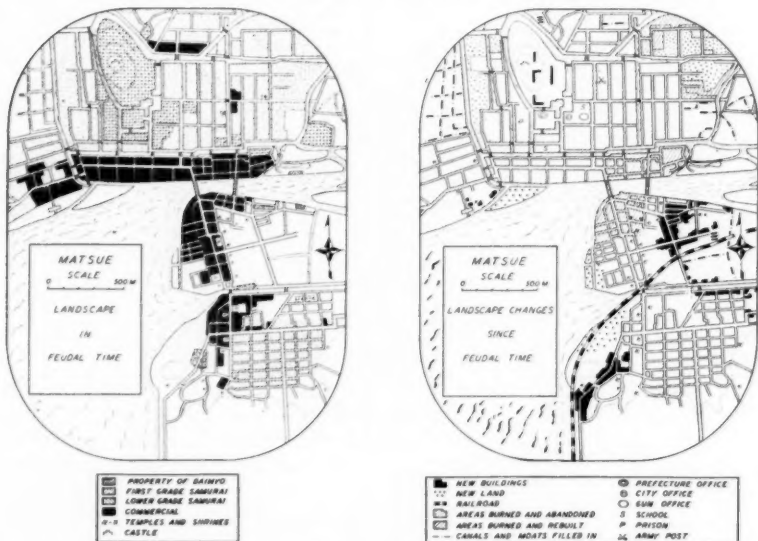


FIG. 3.—The data for the map of feudal Matsue are by courtesy of the Matsue government offices and Messrs. Mori, Nosu, and Kusamitsu.

<sup>7</sup> Map of Akamizu and Suzuki, 1853, Kyoto.

<sup>8</sup> Map of Nagakubo, compiled 1775, pub. 1791, Yedo.

ancient province of Izumo on the western side of Honshu and has been far removed from the main currents of modern Japanese life. Its older character has been little altered.<sup>9</sup> As in the case of all *joka-machi* the functional nucleus and often the nuclear point of attachment was the castle, which was located at some strategic point, ordinarily some bit of high ground near a river or other natural body of water and commanding an important productive area.<sup>10</sup> In Japan, this almost invariably means an alluvial plain. A series of high stone walls surrounded the inner residence of the "Daimyo" or feudal lord. The river water was directed into a series of moats lying between the different walls. Beyond the outer wall and inner moats and along the main roads leading to the castle, the "machi" or business section grew up. In the best residential districts lived the warriors or "Samurai" localized according to their grades. The common people gathered about for protection or to serve the needs of the military group. The street pattern grew up in conformance to the moats and to the main thoroughfares. So that an approaching enemy could not fire directly through the town, the streets were purposely zigzagged and an extremely irregular street pattern resulted.<sup>11</sup> Temples and shrines in some places blocked the natural approaches to the castle which were the most difficult to defend.

The castle town is a relic of the days of a land economy and the feudal city bore strong relationships to the land. Many changes have taken place even in Matsue since the Restoration in 1868, in order to conform to the

<sup>9</sup> Mori, N.: "Matsue City" (*undated separate*). (In Japanese). "In the past thirty-five years, the increase in the population of the Matsue has only averaged 160 per annum. In form there has been no significant change since the Restoration. . . . But, a plan is now under consideration to dredge the Ohashi River to allow steamship traffic. If such an improvement is made, great and rapid change is to be expected."

<sup>10</sup> Ogawa, T.: *Studies in Human Geography*, Tokyo, 1928, p. 99. (In Japanese). "As in the location of Mito, sites for the building of castles were most commonly chosen near difficult crossings of rivers."

Yamazaki, H.: "On the Selection of the Position of Castles," *Chirigakuzasshi*, Dec., 1927, pp. 71-76. (In Japanese). Mr. Yamazaki finds that the presence of forest and bamboo has often been a localizing factor. Clayey sites rather than sandy were chosen, as the latter are difficult to maintain fortifications in. Mountain tops were used as sites for early castles but proved too distant from productive areas and too hard to fortify. Edge of terrace sites became the most common, as they are near to and overlook the productive plains yet present a discouraging slope to them. Traffic routes are shut off in one or more directions yet such sites are accessible for supplies. Hamamatsu, Koriyama, Kanazawa, and Momoyama castles are examples.

<sup>11</sup> Ono, Kin: *A Study of Castle Towns*, Tokyo, 1928. (In Japanese). In this historical treatment the ground plans of many castle towns are shown and a rather thorough study of the more important castle towns is made.



FIG. 4.—The city of Matsue. The ancient castle is to be seen in the background at the left of the picture.

new age in which power and markets are of rapidly increasing significance (Fig. 3). As the castle is now a museum and not a unit of defense, the disadvantages to traffic of such a street pattern have been strongly felt. Fire is a common and often wide-spread occurrence in Japanese cities. This offers an opportunity of straightening out the street pattern and gradually the entire city is being altered. The old moats have lost their utility for defense and many have been filled in. Old areas, occupied under compulsion, have been abandoned. The railroad has caused new growth near it. The private property of the old Daimyo has reverted to the state and the new government has used this land for schools, military barracks and public offices and parks. The Matsue of today still retains much of the old form. As in all of the cities of old Japan, it is difficult to recognize any distinct zoning of different kinds of structures (Fig. 4). The main streets have been straightened for the most part, but the secondary streets still appear as a "flash of lightning." A cross-section profile of Matsue shows how definitely the castle dominates the landscape of the *joka-machi* (Fig.



FIG. 5.—Cross-section profiles of three Japanese cities. a. The upper profile is an exact cross-section of Mikkaichi, an "*ichibi-machi*." The long axes of all buildings are at right angles to the road: b. The middle profile is a composite, but to exact scale, of parts of Nara, a "*monzen-machi*." c. The lower profile is an exact cross-section of a part of Matsue, a "*joka-machi*." Horizontal and vertical scales are the same—approximately 1 inch to 700 feet.

5, bottom profile). An aerial photo of the modern metropolis of Nagoya brings out this same picture (Fig. 6).

Other examples of castle towns are shown in Figure 7. Odawara is typical of the smaller castle towns. The plan of the present town is controlled by the moats and other defenses of the castle and by the great highway which passes by it. Muramatsu is also a simple example and retains the zigzag road pattern. Tsu presents a typical location, occupying a small elevation near a river, and commanding a fertile plain. Kanazawa is a

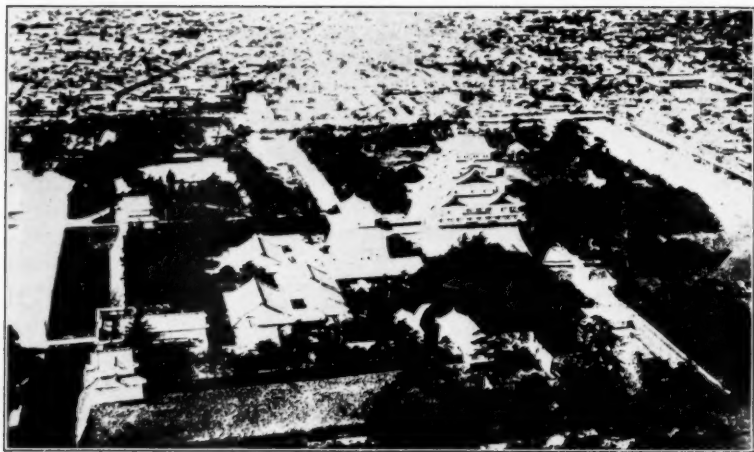


FIG. 6.—Nagoya from the air. Nagoya castle (foreground) is perhaps the finest and most famous in Japan.

more complex example, but shows clearly the present utilization of feudal lords' property, for government offices, military barracks, and schools.

Even the Tokyo of today, after its great growth and modernization and in spite of nearly complete destruction at the time of the great earthquake and fire is still a castle town. Figure 8 shows Tokyo in 1753, while Figure 9 is of the Tokyo of today. The street pattern, the distribution of public buildings and parks, and the zoning of utilities is still largely controlled by the ancient pattern.

Tokyo and Osaka were in some respects unique among the castle towns of Japan. Tokyo was not truly unicellular for in addition to the main castle of the Shogun, now the Imperial Palace, each of the great *Daimyo* maintained a large estate in Edo<sup>12</sup> (Fig. 8). Secondary street systems focused on these centers and help account for the very complex radial pattern of modern Tokyo. Some of the old mansions now remain and are used as colleges, foreign legations, and detached palaces. Osaka differed from the other castle towns in the predominant checker-board pattern of its streets.<sup>13</sup>

<sup>12</sup> Edo was the name of the feudal city; when made the national capital in 1868, its name was changed to Tokyo.

<sup>13</sup> Ogawa, T.: *op. cit.*, p. 100.

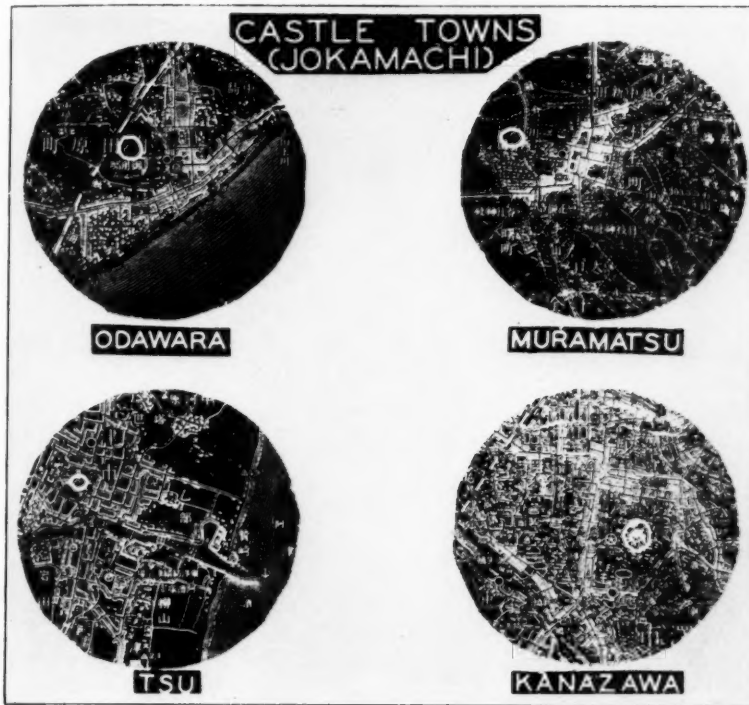


FIG. 7.—Ground plans of "joka-machi." Reduced about one quarter from sections of sheets of the Japanese Imperial Survey on the scale of 1:50,000.

Ueno, as will be noted, had similar characteristics.<sup>14</sup>

#### KYOTO

Kyoto is the only city of modern Japan which reflects the pattern of the ancient "kyo" or capital city<sup>15</sup> (Fig. 10). Like several of its predecessors it was modelled after the plan of Chinese capital cities of its time. Between the years 792 and 794 it rose on the site of the small village of Uda, in the

<sup>14</sup> Crary, D. D.: "Ueno Machi, Mie Prefecture," a paper read before the 1934 meeting of the Michigan Academy of Sciences.

<sup>15</sup> Russell, J. A.: "The Development of the Plan of Kyoto," a paper read before the 1934 meeting of the Michigan Academy of Sciences. The material of this excellent manuscript has been used freely.



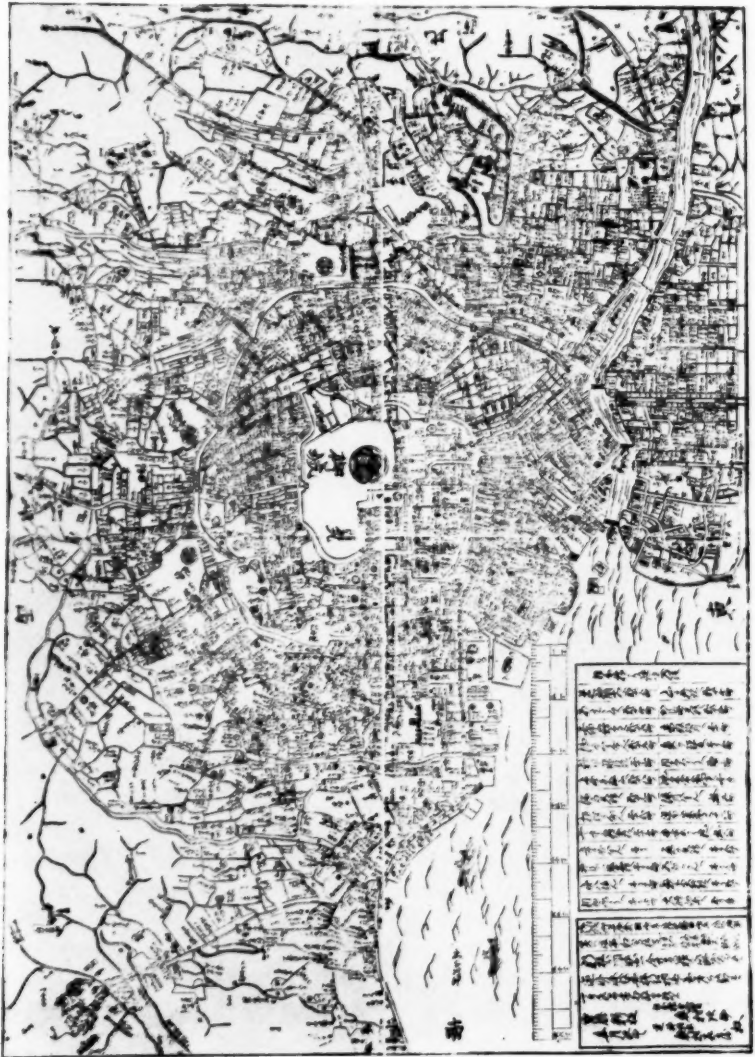


FIG. 8.—Edo, now Tokyo, during the Horeki Era. Published in Edo in 1753. Each right-hand unit of the scale represents 5 cho or about 1500 feet. The family crests shown on the map indicate the estates held by the different feudal lords.



FIG. 9.—Modern Tokyo. Scale approximately 1:200,000. S. Moriya, *Atlas of Japan*.

northeast corner of the Yamashiro Basin, to a city of 80,000 houses and more than 400,000 population.<sup>16</sup> The Imperial Palace occupied the center of the northern part and its grounds extended for a mile from north to south and three-quarters of a mile from east to west. The street pattern was laid down precisely in grid form and oriented to the cardinal points of the compass. The greater streets were eighty feet wide and the secondary ones were forty. They enclosed "cho" or blocks 400 feet square.

Such a systematic regularity of street pattern is a rare element in Japanese city landscapes. It is even more unusual for a Japanese city plan to be in any way a copy of a Chinese city. Ueno, Iga Province, it is true, copied in parts of the town the street of Kyoto, but altered the scale and included many irregularities.<sup>17</sup> The Nara of today, which, next to Kyoto,

<sup>16</sup> Ponsonby-Fane, R. A. B.: *Kyoto*, Hong Kong, 1931, p. 14.

<sup>17</sup> Crary, D. D.: *op. cit.*

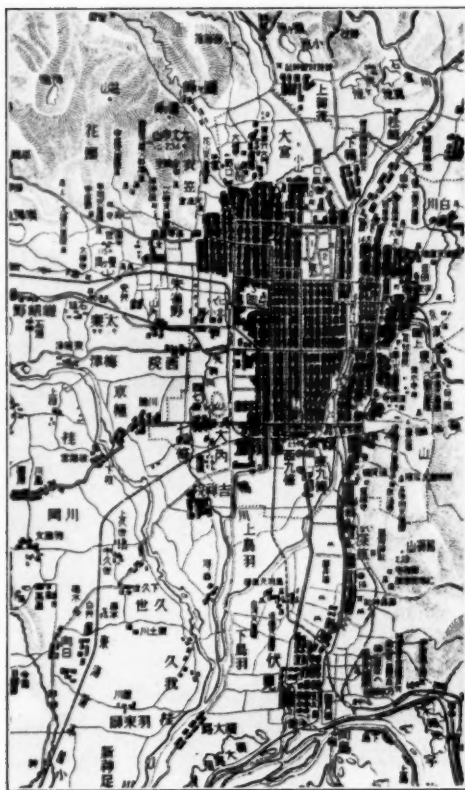


FIG. 10.—Modern Kyoto. Scale approximately 1:150,000. S. Moriya, *Atlas of Japan*.

most nearly approximates the "kyo" type, lies at some distance from the original and now extinct capital of Heijo-kyo. Its street pattern is but roughly rectangular and is not strictly oriented north-south and east-west. The form of the great temple and shrine grounds and the direction of the country roads account more than anything else for the present street pattern.<sup>18</sup>

The original choice of Kyoto's site proved unfortunate as the city was built on the low lying and poorly drained alluvial plain between the Kamo

<sup>18</sup> Hall, R. B.: "The Yamato Basin," *Ann. Assn. Amer. Geogrs.*, vol. 22, 1932, p. 286 and map.

and Katsura Rivers.<sup>19</sup> Gradually the city grew eastward and as fire destroyed the western parts they were not rebuilt. Even the palace was destroyed and by 1591 a new one had been built about a mile east of the old site.<sup>20</sup> The city gradually shifted, making the new palace its approximate center. The suburbs which grew up east of the Kamo River did not maintain the rectangular street pattern, nor did the southern extensions along the Nara Kaido. In fact, fire and rebuilding has destroyed preciseness of pattern in all parts of the city. Finally, the entire western half disappeared and in relatively recent years parts of the new city have spread out onto the higher levels bordering the eastern and northern margins of the plain.

Modern Kyoto is a far cry from the ancient city of Japan's Emperors. In its eleven and a half centuries of existence, it has seen many changes. To be sure it is still a center of culture and pilgrimage, but the smoke of its

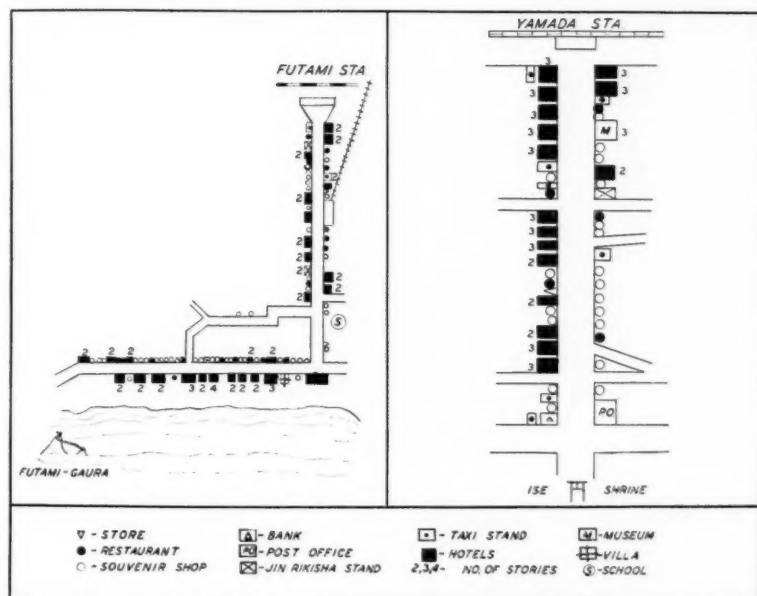


FIG. 11.—Futami and Yamada, simple forms of "monzen-machi."

<sup>19</sup> Yoshida: K.: "Geographical Notes on Greater Kyoto," *Chikyu*, 16, 1931, p. 118. (In Japanese).

<sup>20</sup> Ponsonby-Fane, R. A. B.: *op. cit.*

many factories hangs heavily over the city. Its limits have so extended that it now includes numerous towns and villages and even the old *jokamachi* of Fushimi.

#### TEMPLE AND SHRINE TOWNS

Temple and shrine towns (*monzen-machi*)<sup>21</sup> are usually found at points where a main highway or highways pass some scenic or historical point. The roads leading to the shrine or temple are lined with establishments catering to pilgrims. Inns, souvenir shops and jinrickisha and taxi stands are crowded closely together. Futami and Yamada, in Ise, offer simple

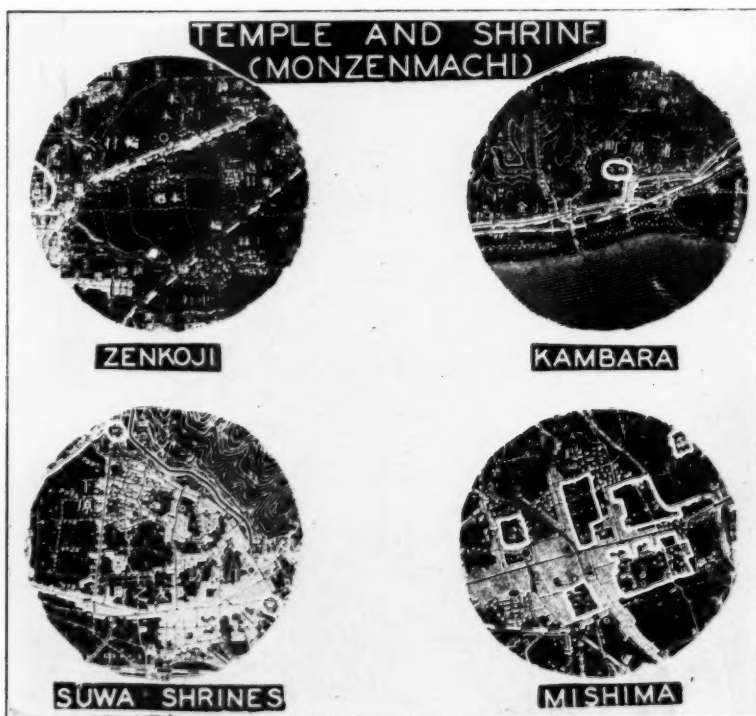


FIG. 12.—Ground plans of "monzen-machi." Reduced about one quarter from sections of sheets of the Japanese Imperial Survey on the scale of 1:50,000.

<sup>21</sup> By strict definition, *monzen-machi* means only temple town; *tori-mae-machi* is sometimes used for shrine town. However, common usage justifies *monzen-machi* for both types.

examples (Fig. 11). Zenkoji (at Nagano) offers a more highly developed example of the simple form (Fig. 12). Kambara shows the attractive force of these great religious centers. In order to approach the temples and shrines of Kambara, the old Tokaido and the settlement on it did not follow the best available trajectory (which is now occupied by the railroad). The Suwa Shrines (spring and autumn) and the old highways leading to them have given rise to a triangular town. Mishima is of an even more complex type where several great temples and shrines have caused settlements to gather about them.

Nara is the greatest of the monzen-machi of Japan. It grew up under the shadow and protection of the great east temples of the ancient Heijo capitol and palace (Fig. 13). During the centuries of unrest following the

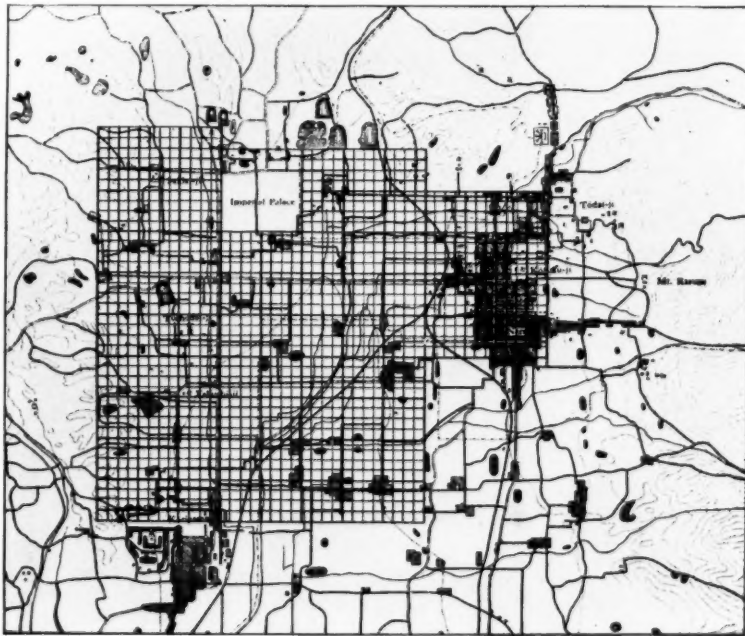


FIG. 13.—Nara, ancient and modern. The ancient settlements are marked by dark shading; the modern city is the area within the heavy grid.

removal of the capitol to Kyoto, merchants and country folk gathered about the great temples for protection. Religion is still the first business of Nara. Some 3,000,000 pilgrims visit the city each year. The great temples and

shrines occupy vast areas and the interiors of nearly all blocks are occupied by small ones. In a somewhat generalized cross-section profile of Nara it will be seen that like the castle of the *joka-machi* the temple or shrine is the really distinguishing feature of the *monzen-machi*. Unlike the castle, which usually occupied a somewhat central position in the town, the temples and shrines most commonly occurred on peripheral locations (Fig. 5, middle profile).

The number of agglomerations which could be termed simple *monzen-machi* are few, but the number in which a famous temple or shrine has played a large part in the economy of the town and definitely affected its morphology are many. Well known are the thirty-three shrines and temples of the Junrei or "Sacred Pilgrimage" of Kinki, and the eighty-eight of the "Pilgrimage of Shikoku." About two hundred others were of national fame at the time of the Restoration (1868) and were listed in all pilgrims' guides and maps of that date. These were widely scattered throughout Japan and each attracted its scores of pilgrims.

#### COMMERCIAL TOWNS

The origin of commercial towns is of three types. (1) The "*shikuba-machi*" or post towns which were established at more or less regular intervals along the great highways of feudal Japan. (2) The "*ichiba-machi*" or market towns. (3) Modern commercial cities "*minato-machi*," which have developed with foreign trade. The *shikuba-machi* often had some other function or functions in addition to its compulsory services to the road. In general, however, the functional nucleus was the barrier and police barracks and the town grew up and down the road from it. There were fine inns and tea houses for the feudal lords and less pretentious inns and pleasure houses for the commoners. Horse stables and porter depots were also distinguishing features. Open market places grew up on the periphery. Many of these old *shikuba-machi* remain with little alteration in form although greatly altered in function and prosperity. Others have grown into great cities and spread far on either side of the ancient road.

Something over 1,800 *shikuba-machi* and seven barrier towns existed at the time of the Restoration, and were so indicated on all road maps of that time. Many of these remained as villages while others had additional functions which overshadowed that of the road. It is safe to say, however, that virtually all of Japan's towns and cities, except those which have come into being since the Restoration, can lay their development and form, wholly or in part, to this cause.

The "*ichiba-machi*" or market town grew up where some unusual opportunity for trade was offered. The most common site was at the inter-



section of two or more important roads. Mikkaichi is such an example. Mikkaichi, Toyama Prefecture, means "Third Day Market."<sup>22</sup> The emphasis on the road is clearly shown in Figure 14 as is the predominance

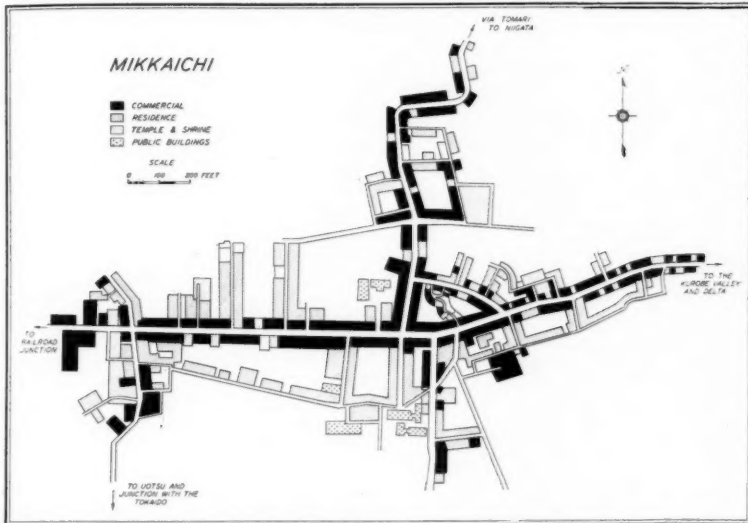


FIG. 14.—Mikkaichi, an "ichiba-machi."

of the commercial function. It was the traveller of the road and the goods he carried which made life possible for the dwellers of the commercial towns. All values were based upon street frontage. At first open market places or stalls were established at the outskirts of the town. Gradually, these were enclosed in permanent structures and new stalls sprang up beyond. The tendency was ever to reach out on the road and to catch the traveller or countryman at the entrance of the town. Stores almost invariably occupy the buildings most remote from the center of the town.

<sup>22</sup> Yokkaichi or "Fourth Day Market" in Mie Prefecture is perhaps the most famous of these ancient fair and market towns. It, however, is now a seaport and has grown and changed greatly. Other examples are: Futsukaichi in northern Kyushu, "Second Day Market"; Itsukaichi in Kwanto, "Fifth Day Market"; Manokaichi in Echigo, in Iwami, and in Ugo, "Seventh Day Market"; Yokaichi in Omi and in Shimofusa, "Eighth Day Market"; and Tokaichi in Echigo, Koshi and Nakaonuma, "Tenth Day Market." These towns held one-day fairs or outdoor markets every ten days and were named after the date of first opening during the thirty-day lunar month.

Unlike the temple and castle town, a cross-section profile shows no really distinguishing features, if we except the fire tower, which is a feature of all Japanese cities, but is peculiarly outstanding in the commercial towns for want of structures of competing elevation (Fig. 5, top profile).

Several of the great modern commercial centers of Japan have grown from small fishing villages since the coming of westernization and world trade. Yokohama, Kobe, and Niigata are examples. The present city of Yokohama occupies what was until the late seventeenth century a bell-shaped inlet of the sea (Fig. 15, lower map). The middle map shows Yokohama at about the time of the Restoration reclaimed as a great rice field. The upper map is the Yokohama of today, in few ways distinguishable from port cities the world over.<sup>23</sup> Of much this same class are Japan's new naval base cities "gunko-machi," such as Kure and Sasebo and the several industrial cities, "kogyo-machi," located on or near the coal fields of Kyushu and Hokkaido.

With few exceptions, all of Japan's modern cities have grown from one of these origins, many had more than one function in feudal days.<sup>24</sup> Shizuoka and Nagoya were both *joka-machi* and *shikuba-machi*. Osaka was both a *joka-machi* and an *ichiba-machi*.

The castle towns have had various fortunes. Some have dwindled to mere villages because of a shift in trade routes since the Restoration. Kishima, on Kishima Strait, was a thriving commercial center as well as a *joka-machi* when the sailing fleet of the lords of Kishima ruled the seas about. The coming of power ships and a central government has reduced the settlement to 65 houses.<sup>25</sup> The one important castle town of Hokkaido in feudal days, has met a similar fate. Fukuyama, once the seat of a great feudal lord, controlled the trade and fishing industry of southern Hokkaido. Since the trade lines have gravitated to Hakodate and the best fishing grounds are now found farther northward, Fukuyama is threatened with extinction. On the other hand, such castle towns as Osaka, Tokyo, Nagoya, Shizuoka, and Hiroshima have maintained or even improved their positions of relative greatness.

<sup>23</sup> From maps and other data in possession of the Mr. Kanbei Yoshida of Yokohama, a direct descendant of Mr. Y. K. Yoshida who brought about the reclamation of the Yokohama area.

<sup>24</sup> Odauchi, M.: *Regional Studies in Geography*, Tokyo, 1931. (In Japanese). In the chapter on Japanese cities, pp. 135-172, the author (p. 157) recognizes two classes of cities, simple and complex. The simple cities are unfunctional and, as the author shows, are very rare.

<sup>25</sup> Watanuki, T.: *Settlement Geography*, Tokyo, 1933, p. 218. (In Japanese).



FIG. 15.—Maps of the Yokohama area from the collection of Mr. Kanbei Yoshida. The lower map shows the site of Yokohama as an embayment of the sea. The middle map shows the same area after its reclamation as a paddy field. The upper map shows Yokohama today.

The cities which depended primarily upon their religious functions have remained small, although with improved transportation the great national shrine and more famous temple towns have made an absolute growth.

In general, the towns which had strong natural locational advantages in feudal days have retained them and have become the great industrial and

commercial cities of modern Japan.<sup>26</sup>

*University of Michigan,*  
*February, 1934.*

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<sup>26</sup> [Editor's Note.] Other aspects of Japanese cities have been treated in current periodicals by two other American geographers:

Trewartha, Glenn T.: "Japanese Cities: Distribution and Morphology," *Geog. Rev.*, 24, 1934, pp. 404-417.

Davis, D. H.: "Some Aspects of Urbanization in Japan," *Jl. of Geography*, 33, 1934, pp. 205-220.

Type Occupance Patterns in Hokkaido<sup>1</sup>

DARRELL HAUG DAVIS

There are two major types of occupied land in Hokkaido: upland and lowland, with concomitant differences in economies and occupancy patterns. In addition, age of use and climatic factors modify locally the conditions of both of these major types. These three variables: type of land in use, age of settlement and climate exist in numerous combinations, but for the sake of simplicity and keeping in mind the fact that transitional types of land use will evolve in marginal areas, it is possible, by the recognition of five types, to afford an adequate picture of occupancy patterns in the Dô. The following pages are devoted to these five types.



FIG. 1.—Identification map showing shichos, rail lines, cities, and the location and approximate size and orientation of the type areas mapped in detail in Figs. 2-5.

<sup>1</sup> A study based on field work in 1932, supported in part by Fluid Research Funds of the University of Minnesota.

## A LONG-SETTLED, RICE-GROWING LOWLAND

As a type of rice-growing lowland of older settlement, an area in Kamikawa Shicho<sup>2</sup> between the agricultural villages of Nagayama to the northeast and Higasi-Asahigawa to the south has been selected. This comprises a portion of the alluvial plain of the Shubetsu, a tributary of the Ishikari River, about five miles northeast of Asahigawa. (See Figs. 1 and 2.)

This area has been occupied since 1900 or shortly thereafter as rail construction made early settlement possible. Population is concentrated on the flat land of the valley where gentle slopes facilitate the construction of ditches to supply irrigation water to the peaty soils of the relatively dry paddies. There are few waste areas on the lowland and almost no trees. The uplands are uninhabited, as steep slopes and generally poor soils prohibit agriculture. Scattered trees occur on these steeper slopes where clearing has not removed completely the original forest cover.

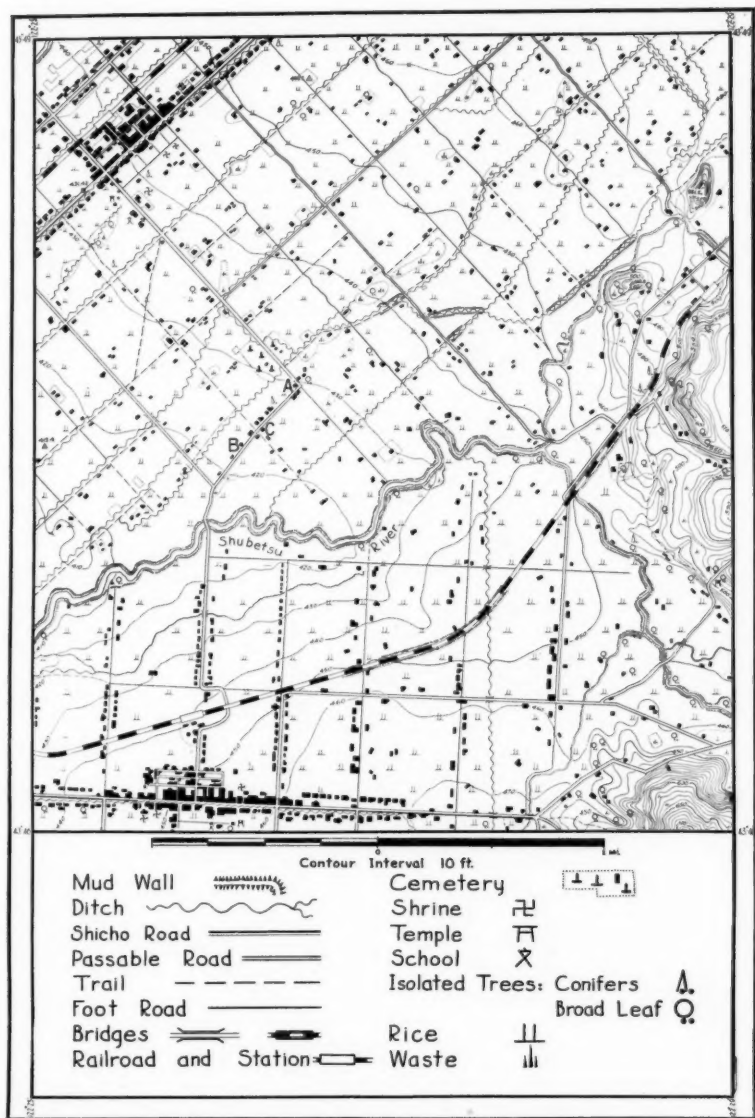
With a rainfall of 42 inches, average July and August temperatures of 68 degrees or more, a relatively short frost-free season of variable but sufficient length, climatic conditions, as well as topography and soils, are favorable for rice, the major and often the only crop on the lowlands. For Kamikawa Shicho, rice occupies 55% of the total acreage in cultivated crops; oats 19%; potatoes 13%.

The rectangular system of roads, land holdings and irrigation ditches reflects foreign influence; the definite application of the pattern, topographic limitations. Main highways are gravelled, adequately drained, all-weather roads of fair width; secondary roads are poor, varying from footpaths to those which can be used by carts but not by cars. Land holdings are not large as indicated by the density of occupance and individual paddies are frequently as small as in other parts of Japan, a condition apparently resulting from the exercise of human choice—a non-geographic factor. Two rail lines, one on either side of the lowland, serve the area;<sup>3</sup> no house is more than a short distance from the numerous stations, two of which are shown in Fig. 2. This condition is typical throughout the occupied areas of Hokkaido.

<sup>2</sup> Hokkaido (the Dô) is subdivided into "shicho" for administrative purposes.

<sup>3</sup> The relationship of the rail lines of this and other type areas to the railway system of Hokkaido can be ascertained by reference to Fig. 1.

FIG. 2.—A rice-growing lowland of older settlement. A portion of the Asahigawa Basin, one of a series of intermontane basins lying between the two main north-south mountain ranges of Hokkaido. Areas in agricultural use are delimited by dotted lines. If the crop is rice, that fact is indicated; other areas in production are in upland or dry land crops.





The houses show relatively little foreign influence either in line or in construction, much less than in some other portions of Hokkaido. They are spaced rather uniformly over the area, though in some portions there is a noticeable concentration along the better roads; this is characteristic in other areas in Hokkaido as well.

Essentially the only crop is rice; it dominates the entire agricultural economy and displaces all other farm activities in this type area. Wherever topography, climate and water supply permit, especially on the peaty alluvium of the river valleys, rice displaces all other crops in Hokkaido as it is more profitable where conditions are favorable for its production.

PLATE I (upper)—Typical occupancy pattern on the lowlands of the older-settled rice-producing areas. Looking southwest from A, Fig. 2, towards the mountains. Piles of rice straw in the paddies will be plowed under as fertilizer. April, 1932.

PLATE II (middle)—Plowing the paddy for rice planting. Looking northwest from B, Fig. 2. April, 1932.

PLATE III (lower)—Main, all-weather, gravelled road with secondary irrigation ditch at left. Looking south from C, Fig. 2. The house, with its wall of rice straw to shut off cold winter winds, and the sled are of types common in Hokkaido.



## A LONG-SETTLED, LARGELY UPLAND AREA

The Ishikari Plain, settled at an early date as rail construction enabled occupation after 1885, illustrates typical Japanese occupancy of uplands in Hokkaido in areas of older settlement. The section of the Ishikari Plain chosen as the type area lies south of Atsubetsu, six miles east of Sapporo. (See Figs. 1 and 3.)

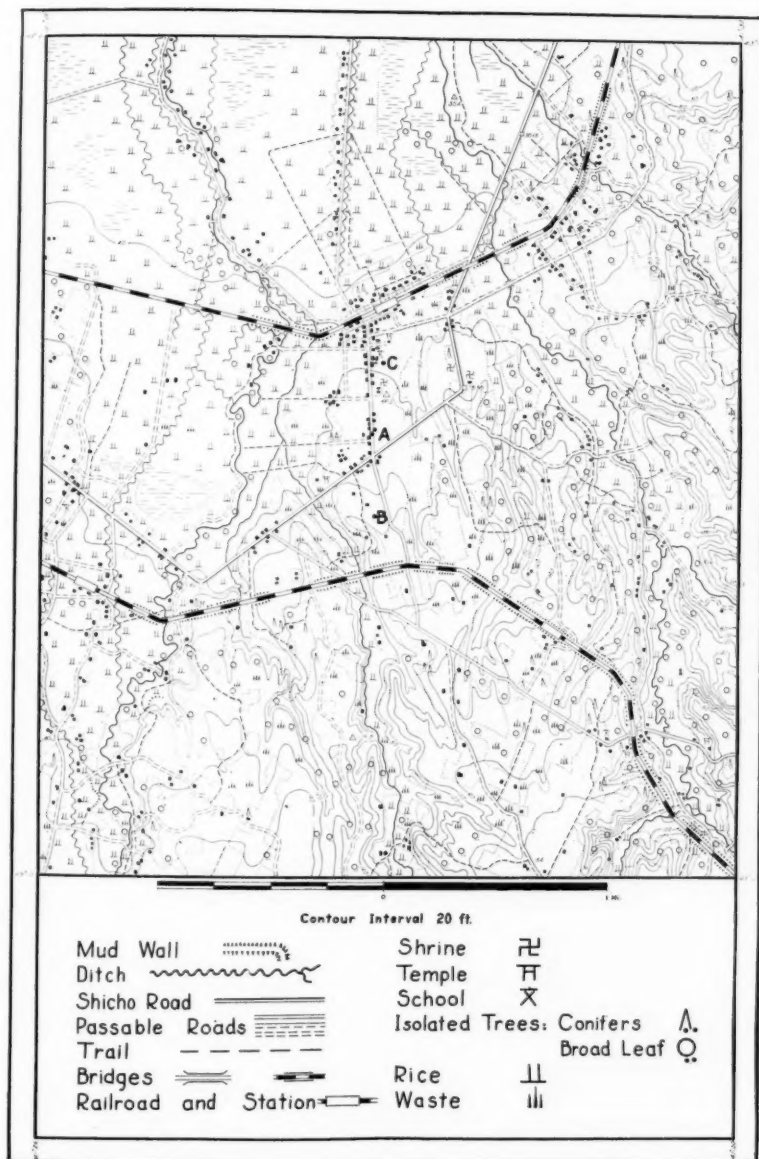
The upland, consisting of a series of coalescing alluvial fans, is without much relief; in many places and along the axes of the fans, it is distinctly flat, but across the slope of any individual fan, the smooth surface may be interrupted by shallow valleys as in the type area where the surface is dissected by small streams flowing north to the Toyahari, a tributary of the Ishikari River.

The soils of the upland are derived from worked-over volcanic ash and vary greatly in character, but all need fertilization. The soils of the alluvial areas are high lime, sedge-grass peats, deficient in both potash and phosphate. In some places, they are very wet and still need drainage before they can be brought into use; in other, better drained portions, they are now used for growing rice. Predominantly, the type area, the Atsubetsu district, is upland and typical of conditions throughout the Ishikari Plain as regards the distribution of upland and lowland.

The weather record of Sapporo is of sufficient length to afford satisfactory information as to climatic conditions. Precipitation averages slightly in excess of 40 inches; during July and August, average temperatures range from 65 to 68 degrees; the frost-free season has an effective length of at least 130 days. These conditions are all favorable for agriculture and tend to make this one of the best and most highly developed of the agricultural regions of the Dô. In 1929, out of the total acreage in cultivated crops in Ishikari Shicho, 68% of the area was in upland crops; only 32% was in rice. There is also a relatively important animal industry, including dairying, in most of the upland portions of the plain.

For the Ishikari Plain as a whole, the road mesh has a rectangular pattern, affected in its larger aspects by the disposition of the surfaces of the alluvial fans. In the type area, the rectangular pattern largely disappears and houses are concentrated in "strassendorfs" along the major highways to a much greater extent than is the case in the wider portions of the plain where the location of the individual land holdings with reference to the main highways makes this condition impossible.

FIG. 3.—A long-settled, largely upland area. A portion of the Ishikari Plain, the largest plains area in Hokkaido. Areas in agricultural use are delimited by dotted lines. If the crop is rice, that fact is indicated; other areas in production are in upland or dry land crops.



Houses, gambrel-roofed barns, silos, and even an occasional windmill on individual farms, as well as on the Experimental and Demonstration Farms maintained by the Hokkaido Government, reflect foreign influence in their appearance. The landscape, at some distance, resembles to a surprising degree that of an American farming area, but closer inspection dispels this impression as the type of construction of all buildings is Japanese, even though the form of the structures is foreign.

PLATE IV (upper)—Looking north on the wide, gravelled main highway south of Atsubetsu, A, Fig. 3. A "strassendorf," with house types modified by foreign influence. Open well with sweep at the left; rack of poles for drying harvested rice at the right. April, 1932.

PLATE V (middle)—Level upland and lowland in rice paddies. Looking west toward Sapporo and the snow covered mountains from B, Fig. 3. April, 1932.

PLATE VI (lower)—Rear view of farmstead with foreign type buildings south of Atsubetsu, C, Fig. 3. Barns at right, silo at left, house in the rear of silo. Typical of many of the larger farmsteads of the Sapporo district. April, 1932.



## A NEWLY OCCUPIED UPLAND AND LOWLAND AREA

Spread of population in Hokkaido has been to the east and northeast from the section of earliest settlement, the west coast of the Hakodate Peninsula, and has followed rather than preceded rail construction.<sup>4</sup> One of the last of the areally important agricultural regions to be thus occupied was the valley of the Tokoro River and the adjacent uplands. Through lack of rail facilities, most of this region did not come into use until subsequent to 1915-1920, though there was some settlement from the seaboard as early as 1880. A portion of this area about four miles west of Nokkeushi, including the agricultural village of Aiononai, has been selected as the type area. (See Figs. 1 and 4.)

This type area embraces upland and lowland, both formerly forested but now retaining but few traces of the former cover. On the lowlands, soils are peaty alluvium and water for irrigation is available, conditions favorable for rice production, yet up to 1922 there was but little occupation of the lowlands as the upland areas were more attractive to the early settlers because of the greater ease with which they could be brought into production. Numerous stumps in the rice paddies today bear witness to the recency of their utilization. Another reason for the late date of occupation of the area, and particularly of the lowlands, was climatic conditions. The weather records indicate a rainfall of not to exceed 32 inches, with occasional droughts; average July and August temperatures of 62 and 66 degrees respectively; and a relatively short frost-free season with an effective length of approximately 110 days. These conditions introduce agricultural hazards which have in certain years, as in 1931, resulted in emigration from the Nokkeushi district.

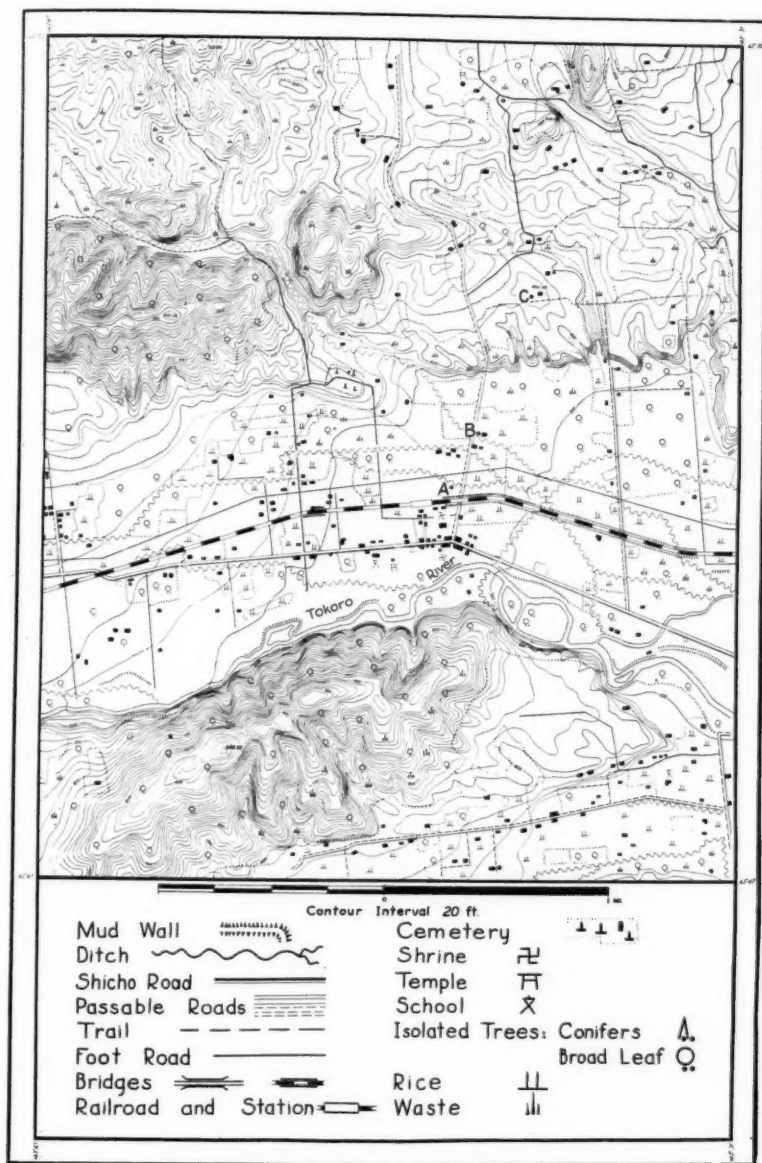
The road pattern departs from the rectangular on the uplands, roads following drainage lines as in other hilly areas; on the lowlands in the type area, east-west and north-south roads are favored by surface conditions, including the trend of the valley. Roads are both narrow and poor, probably because of the recency of the occupation.

Some of the houses are American in general appearance, but such buildings are all of flimsy Japanese construction and but illy adapted to climatic

<sup>4</sup> For a more detailed account of the spread of settlement in Hokkaido, see D. H. Davis: "Present Status of Settlement in Hokkaido," *Geog. Rev.*, Vol. XXIV, No. 3, July, 1934, pp. 386-399.

FIG. 4.—A newly occupied upland and lowland area, a portion of the valley of the Tokoro River and the adjacent uplands. Areas in agricultural use are delimited by dotted lines. If the crop is rice, that fact is indicated; other areas in production are in upland or dry land crops.





conditions; others are more or less temporary structures erected by newcomers. They are scattered on individual land holdings with some tendency toward concentration on the margins of the upland wherever land ownership admits, but with little or none along the main highways.

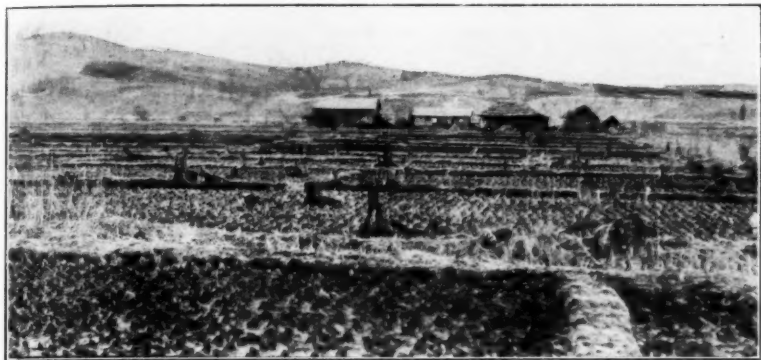
The varied type of agriculture of Abashiri Shicho, of which this type area is a part, is indicated by the following percentage distribution of acreages among the principal cultivated crops in 1929: oats 25%, rice 24%, peas 18%, beans 8%, rye 8%, potatoes 6% and buckwheat 3%.<sup>5</sup>

<sup>5</sup> For a more detailed account of agriculture and crops in the type regions considered in this article, see D. H. Davis: "The Agricultural Occupation of Hokkaido," *Economic Geography*, Vol. 10, No. 4, October, 1934, pp. 348-369.

PLATE VII (upper)—Looking north across the rice paddies from A, Fig. 4. Stumps in the fields indicate the recency of the occupation. April, 1932.

PLATE VIII (middle)—House under construction, B, Fig. 4. American in line, construction is purely Japanese, with plaster applied directly to the bamboo mesh of the sidewalls, a type of construction poorly suited to the long, cold winters of the area. April, 1932.

PLATE IX (lower)—Looking north across the upland from C, Fig. 4. Storage building at left; farmsteads in the middle foreground; plowed fields predominating in the gently rolling landscape where patches of snow still lay on the ground April 21, 1932.



## A STOCK RAISING AND MIXED FARMING UPLAND AREA

The Tokachi Plain is largely upland with alluvial plains of limited areal extent bordering the Tokachi River and its larger tributaries. The seaward end of the plain extends to the foggy south coast where climatic conditions eliminate agriculture but the inland portion is not thus handicapped. Initial settlement was from the seaboard, but no important occupation occurred until after the construction of the rail line from Asahigawa eastward to Obihiro, or until 1910 and thereafter. As the type area, a portion of the Tokachi Plain about three miles north of Obihiro has been selected, an area consisting of both upland and alluvium in characteristic proportions and relationships. (See Figs. 1 and 5.)

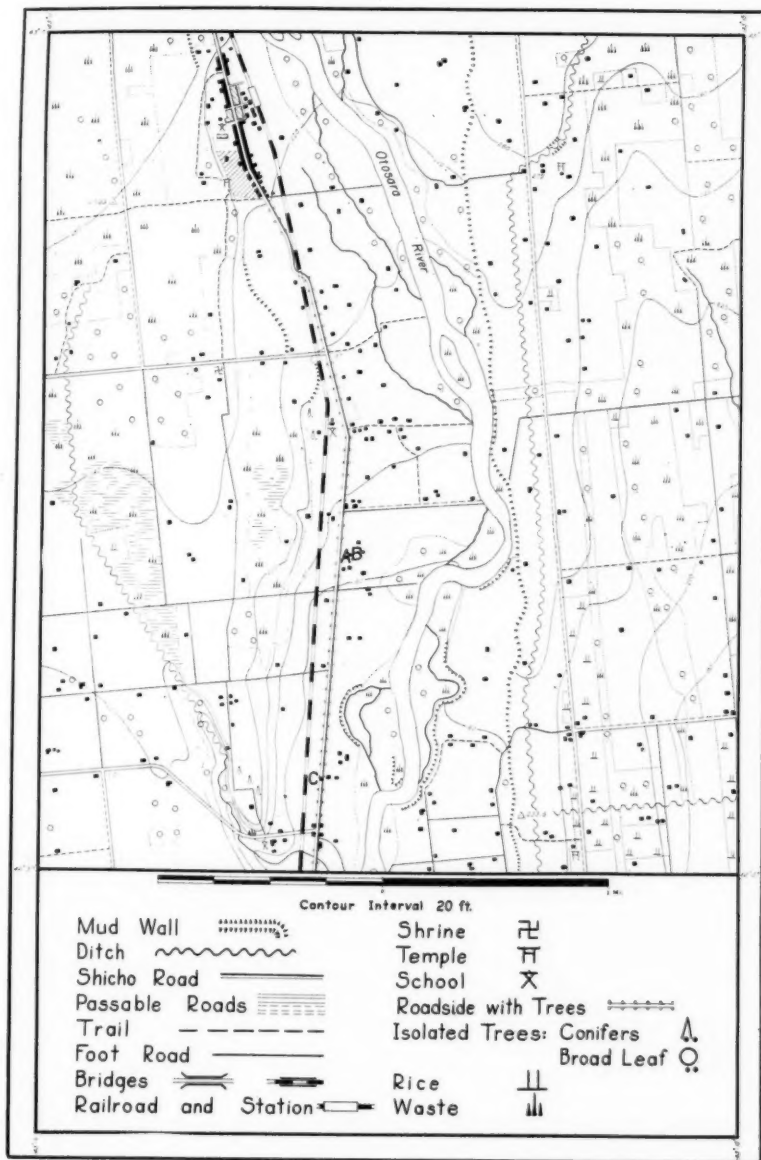
Upland soils are derived from volcanic ash and need heavy fertilization; the soils of the alluvial areas generally contain such high percentages of organic material that they are classed as peats. They are deficient in potash and phosphate but normally they do not need liming. The precipitation at Obihiro averages a trifle over 38 inches, with a distinct summer maximum; average July and August temperatures vary from 64 degrees for the former month to nearly 69 degrees for the latter; the effective frost-free season probably does not exceed 110 days in length, about the same as for the Nokkeushi district. Climatic conditions do not prohibit agriculture though they impose limitations which have influenced the rapidity of settlement.

The rectangular pattern of roads, modified on the Tokachi Plain as elsewhere by local topographic conditions, is particularly well developed in the type area, roads not only intersecting at right angles but trending almost north-south and east-west as well.<sup>6</sup> In the type area, as in most of the district adjacent to Obihiro, main roads are good, despite which fact the population pattern is a disseminated one. House types vary greatly; some show traces of the architecture of the home areas of the immigrants; others are foreign in effect; still others reflect Ainu influence; there are even a few of pure Ainu type, occupied by Ainu.

This is an area of upland crops and an important animal industry: horse breeding. In 1929, upland crops: beans, peas, oats, buckwheat, potatoes, wheat, rye and barley, named in the order of importance as measured

<sup>6</sup> For a more detailed statement as to land survey, see Robert B. Hall: "Some Rural Settlement Forms in Japan," *Geog. Rev.*, Vol. 21, No. 1, January, 1931, pp. 93-123. ("The Tokachi Type," pp. 119-122.)

FIG. 5.—A stock raising and mixed farming area. A portion of the Tokachi Plain near Obihiro. Areas in agricultural use are delimited by dotted lines. If the crop is rice, that fact is indicated; other areas in production are in upland or dry land crops.



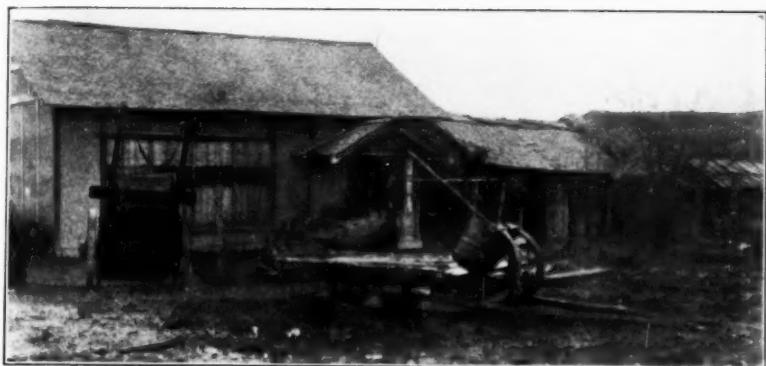
in acreages, occupied 83% of the land in cultivated crops in Kasai Shicho; the lowland crop, rice, slightly less than 16%. The shicho also ranked first in Hokkaido in the number of horses, with nearly 18% of all the horses in the Dô; other animal industries were unimportant.<sup>7</sup>

<sup>7</sup> Statements in this and other sections as to soils and adricultural systems are based on information supplied by Keitaro Urakami, Chief Expert, Section of General Affairs, Main Station, Hokkaido Experiment Station, Kotoni, Sapporo.

PLATE X (upper)—View across the flat upland of the Tokachi Plain, looking south from A, Fig. 5. Two farmsteads, partially enclosed by walls of rice straw to cut off cold winds. The house at the right shows Ainu influence in its architecture. April, 1932.

PLATE XI (middle)—Japanese type house with roof of Japanese wood shingles. Shed and barn are continuous with the house. Typical Hokkaido sled and two-wheeled Hokkaido cart. B, Fig. 5. April, 1932.

PLATE XII (lower)—Ainu house and farmstead four miles north of Obihiro. The wall of rice straw, fastened to crosspieces attached to upright poles, is designed to afford protection from cold winds. Looking north from C, Fig. 5. April, 1932.





## A NON-AGRICULTURAL FISHING AND GRAZING AREA

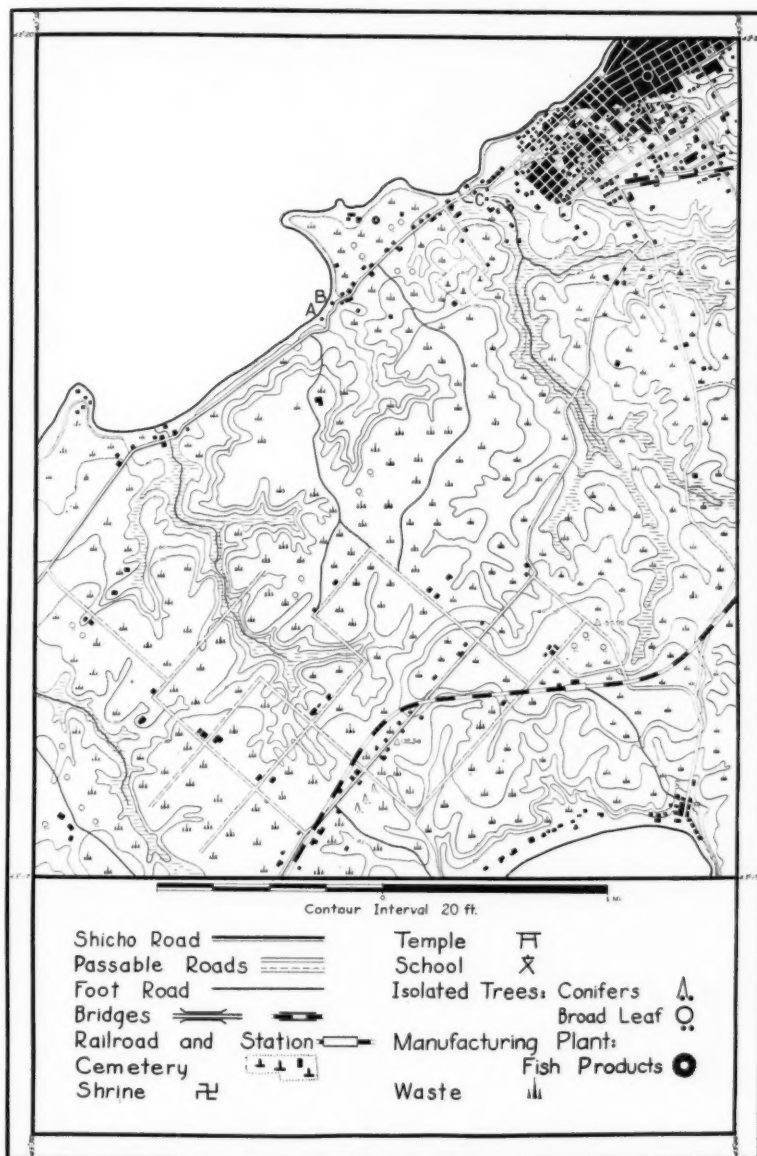
The occupance of the extreme east of Hokkaido and of the eastern portion of the southern coast has but little in common with that of the balance of the Dô. The district immediately west of Nemuro, beyond the rice zone, is a rather extreme example of conditions in this subregion, and has been selected as the type area because it illustrates so strikingly the conditions which exist in modified form in the transition zones to the west. (See Figs. 1 and 6.)

The type area consists of a terrace of slight elevation and gently undulating surface, dissected by the shallow valleys of several short streams. Along the coast, the land in most places either rises in gentle slopes to the wider, lower portions of these valleys or there is a narrow, sandy beach. The upland soils are low lime, sphagnum, moor peats, permanently non-agricultural in character; in the shallow valleys, the land is somewhat marshy and the peat soils may be somewhat better, though not in agricultural use locally.

For Nemuro Shicho as a whole, only 17,297 acres were in cultivated crops in 1929 as contrasted with 245,221 acres for Kamikawa Shicho in the same year. This small acreage results from climatic limitations. The frost-free season is of ample length, varying from 140 to 180 days; the rainfall of slightly over 38 inches is sufficient in amount, but the summers are too cool and too cloudy and foggy. In only one month, August, does the average temperature rise to as much as 63 degrees; in July it is only 57 degrees. Agriculture is confined to the more sheltered valleys and to the higher uplands of the shicho where soils and climatic conditions are slightly better. The unfavorable character of climatic conditions is evidenced by the greatly dwarfed trees, both conifers and hardwoods, in many cases draped with moss. The land offers little opportunity except for pasturage for a considerable number of horses and a much smaller number of cattle; other animal industries are of negligible importance.

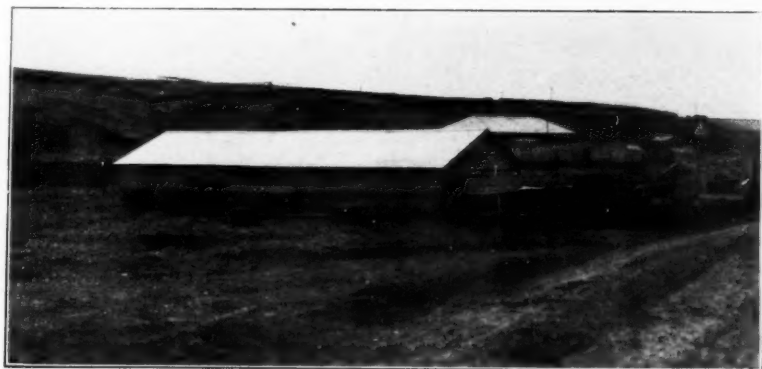
The rectangular pattern of roads, mostly poor, noted in other type areas is also evident in the Nemuro district, and as elsewhere, roads trend with the physical features rather than in fixed compass directions. Here, however, the sea rather than the land affords the major highway and the source of sustenance for the population. Hence most of the houses are located either along the shore or easily accessible to the sea, with a secondary concentration along the Shicho roads. Essentially all human activities are centered around the fishing industry. Nemuro, an old, rather dingy town

FIG. 6.—A non-agricultural, fishing and grazing area. A portion of the Nemuro district of southeastern Hokkaido.



with narrow, crooked, unpaved streets without sidewalks, but with a busy waterfront, is the focus for the trade of the area. The numerous canneries and the fact that 90% of the trade of Nemuro is in fish and fish products testify to the importance of the sea in the economic life of the community and differentiate this from the other four type areas.

- PLATE XIII (upper)—A group of fishermen's houses at the mouth of a small creek. Looking north from A, Fig. 6. Men engaged in turning over fish fertilizer spread out on mats to dry; fishing boat drawn up on the beach at low tide. April, 1932.
- PLATE XIV (middle)—Fishermen and their families: men, women and children, preparing the fish which have just been brought in by the men. B, Fig. 6. April, 1932.
- PLATE XV (lower)—Fish cannery; buildings at the left; kettles for cooking the fish at the right. C, Fig. 6. April, 1932.



## SUMMARY

Two types of arable land occur in Hokkaido: the flat, recent alluvium and the adjacent uplands of gentle slopes, the dominant type varying from area to area and the extent to which either of the two types is in use varying in similar fashion—in part determined by the age of settlement. The type of land in use determines the crop system; on the uplands, cultivated crops are oats, beans, potatoes, peas and buckwheat with some rye, wheat and barley, though both wheat and barley are much less important, both actually and relatively, than in the southern islands where two crops a year are possible. On the alluvium, rice displaces all other crops.

There is no single pattern of rural occupance; crop systems, topographic conditions, road patterns and types of roads and other factors of lesser importance operate in varied combinations to produce considerable differences between type areas and minor differences within the individual areas. In general, farm houses are scattered and widely spaced on individual land holdings and there is an absence of the characteristic agricultural villages of the southern islands. Farm areas are linear in character and farms are confined to stream valleys and their borders, so that by the use of local trains which run slowly and stop frequently, it is possible to see most of agricultural Hokkaido rather satisfactorily from a train window.

House types show the effects of the many localities in Japan from which the settlers came, Ainu impress to a limited degree in certain areas, and foreign influence more markedly. All are poorly adapted to the severe winter climate of Hokkaido. Stoves commonly replace hibachi during the colder weather but even these are not effective in heating the flimsily constructed houses. Log houses would be well suited to pioneer occupation in Hokkaido, but Japanese sources of information as well as personal observation would indicate that even in forested areas of recent settlement, this type of construction is not in use.

Increasing density of population will in time lead to a closer occupance pattern and to greater intensity of cultivation, so that present conditions in the type areas may be modified slightly with increasing age of settlement, but no material changes in crop systems or other aspects of the agricultural economies are to be expected. Present conditions will remain essentially static; such change as takes place will be slow of occurrence and will effect no fundamental alterations in present occupance.

## A NOTE ON THE MAPS

Different types of maps presenting geographic data must necessarily result from varied objectives for their construction. For certain purposes, the extremely detailed map may be desirable, but for the graphic portrayal

of cultural landscapes in map form with a view to facilitating effective comparison and contrast of significant similarities and differences in occupance, too detailed recording of data on the map introduces definitely undesirable complexity. Many detailed maps, designed to present facts of land occupance compactly and clearly, accomplish only the first of the two objectives. In the mapping of type areas for purposes of comparison, the particular crop in a given field in a definite year is unimportant; only crop systems: the relationship of crops in either importance or sequence; the pattern and character of the communication mesh; ditches and other drainage lines, both artificial and natural; houses and similar occupance works of man and facts of equal permanency of location are of real significance and worthy of record on the map.

In the older phases of geography, this necessity for various types of graphic areal presentation is recognized. The block diagram is accepted for the representation of generalized land forms where more detailed delineation of surface features would be confusing. In similar fashion, the cultural landscape can be depicted satisfactorily for many purposes by generalized maps. With this concept of the limitations of the detailed map and of the type of map which should be used for purposes of illustrating differences in occupance patterns in type areas, the attempt has been made to indicate the principal, though not necessarily all, types of occupance in Hokkaido at the present time by a series of maps,<sup>8</sup> with a few illustrations and a limited amount of text to supplement the facts shown in mapped form.

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<sup>8</sup> Maps of type areas accompanying this article are based on topographic sheets, drawn to the scale of 1:50,000, compiled by the Japanese Imperial Army. These are military as well as topographic maps and they contain an almost embarrassing wealth of detail; there are a total of some 105 different symbols with legends in Japanese listed on the margins of the sheets. Due credit should be given this source in evaluating the accompanying maps of type areas which were compiled from foot traverse with camera and notebook to supply necessary additional information.

*University of Minnesota,  
September, 1934.*